

# Lower Pliocene Progradational Play

## LP P1, #1061

*Textularia* "X"

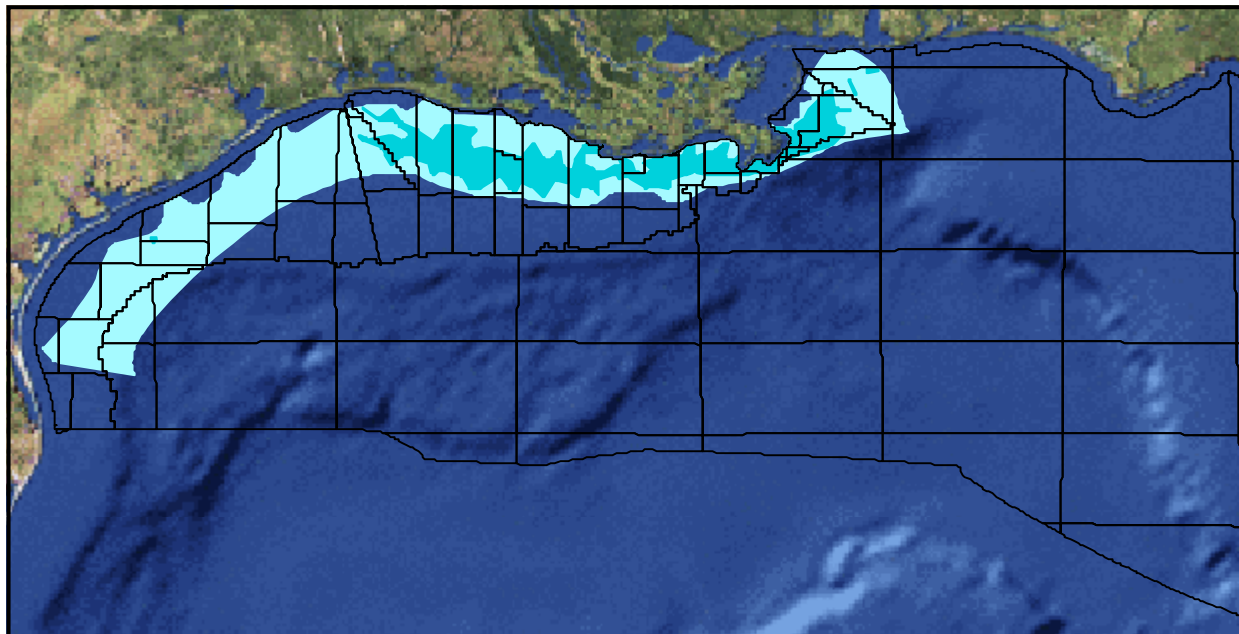


Figure 188. LP P1 map showing location of play. Play limit shown in light cyan; hydrocarbon limit shown in dark cyan.

## Overview

The Lower Pliocene Progradational Play (LP P1) contains the fourth largest amount of reserves of any GOM play ([Figure 2](#)), with 7,929.197 Bcfg and 1,354.009 MMbo (2,764.899 MMBOE) in 752 sands in 145 fields. Comparing all 65 GOM plays, LP P1 ranks third in oil reserves (9%). Additionally, comparing the 13 progradational plays, LP P1 ranks third in oil reserves (16%). The play extends continuously from the North Padre Island and Port Isabel to Destin Dome Area ([Figure 188](#)).

## Description

LP P1 is defined by (1) a progradational depositional style representing major regressive episodes in which sediments outbuild onto the shelf and slope and (2) the LP Chronozone, the top of which is defined by the *Textularia* "X" biozone ([Figure 8](#)).

LP P1 extends continuously from the North Padre Island and Port Isabel Area offshore Texas to the west-central Destin Dome Area east of the modern Mississippi River Delta ([Figure 188](#)). Hydrocarbons have been encountered in much of that same

area, except for most all offshore Texas because of an apparent lack of shelf source sands during LP time.

The ancestral Mississippi River Delta System dominated deposition of the play's sediments. The depocenter present in the offshore Texas area no longer received significant amounts of sand-rich sediments during LP time (Morton et al., 1985).

The ancestral Mississippi River Delta System continued to prograde basinward with time, reflected in the farther basinward occurrence of LP P1 sediments versus older upper upper Miocene (UM3) progradational sediments, specifically in the East Cameron through South Pass Area.

## Play Limits

LP P1 deposits grade into the sediments of the Lower Pliocene Aggradational Play (LP A1) in an updip direction. An apparent lack of shelfal source sands limits LP P1 in updip and southwest directions in the Texas offshore. LP P1 also extends onshore in some areas. At its farthest northeast extent, the play pinches out. LP P1 deposits grade into the sediments of the Lower Pliocene Fan 1 (LP

F1) and Lower Pliocene Fan 2 (LP F2) Plays in a downdip direction.

## Depositional Style

LP P1 is characterized by sediments deposited predominantly on the LP shelf, with less common, generally finer grained sediments deposited on the LP upper slope. These sediments represent major regressive episodes in which outbuilding of both the shelf and the slope occur. Additionally, retrogradational, reworked sands with a thinning and back-stepping log signature locally cap the play. Because these retrogradational sands are poorly developed, discontinuous, and not correlatable for any significant distance, they are included as part of LP P1.

The LP progradational interval varies from approximately 50 to more than 4,700 ft in thickness, with net sand thicknesses as much as approximately 1,200 ft. Individual sand-dominated successions, from a few feet to approximately 200 ft thick, are separated by shale intervals that are a few feet to several hundred feet thick. Progradational depositional facies, predominantly comprising delta fringe sands, channel/levee complexes, and distributary mouth bars, characterize LP P1. These facies exhibit upward-coarsening (delta fringe and distributary mouth bar) and blocky to upward-fining (channel/levee) log signatures. The thickest sand-dominated intervals probably represent stacked facies of multiple episodes of delta-lobe switching and progradation. The play also commonly contains shelf blanket sands, crevasse splay deposits, and delta slump deposits that are characterized by isolated, prominent, and subdued spiky log patterns.

## Structural Style

About one-third of the fields in this play are structurally associated with salt diapirs—shallow, intermediate, and deep depths—with hydrocarbons trapped on diapir flanks or in sediments draped over diapir tops. Other fields are structurally associated with anticlines, normal faults, and growth fault anticlines. Some fields also contain hydrocarbon accumulations trapped by permeability barriers and updip pinchouts or facies changes.

## Quantitative Attributes

On the basis of reserves calculations, LP P1 contains 51% gas and 49% oil. The 752 sands in the play comprise 2,169 reservoirs, of which 928

	No. of Sands	Oil (MMbbl)	Gas (Bcf)	BOE (MMbbl)
Proved	752	1,354.009	7,929.197	2,764.899
Cum. production	727	1,233.284	6,879.818	2,457.451
Remaining proved	404	120.725	1,049.379	307.447
Unproved	0	0.000	0.000	0.000

Table 87. LP P1 reserves and cumulative production.

are nonassociated gas, 1,069 are undersaturated oil, and 172 are saturated oil. All reserves are proved and estimated to be 7,929.197 Bcfg and 1,354.009 MMbo (2,764.899 MMBOE) (Table 87). These reserves account for 69% of the reserves for the LP Chronozone.

Of all 65 GOM plays, LP P1 ranks third in oil production (11%). Cumulative production from LP P1 totals 6,879.818 Bcfg and 1,233.284 MMbo (2,457.451 MMBOE) from 727 sands from 142 fields. LP P1 production accounts for over 73% of the LP Chronozone's total production. Remaining proved reserves in the play are 1,049.379 Bcfg and 120.725 MMbo (307.447 MMBOE) in 404 sands in 107 fields.

Table 88 summarizes that water depths of the fields in LP P1 range from 13–674 ft, and play interval discovery depths vary from 1,184–17,350 ft, subsea. Additionally, porosity and water saturation range from 16–38% and 16–61%, respectively.

752 Sands	Min	Mean	Max
Water depth (ft)	13	115	674
Subsea depth (ft)	1,184	10,099	17,350
Reservoirs per sand	1	3	95
Porosity	16%	28%	38%
Water saturation	16%	29%	61%

Table 88. LP P1 sand attributes. Values are volume-weighted averages of individual reservoir attributes.

## Exploration History

LP P1 has a 50-year history of discoveries (Figure 189). The first sands in the play were discovered in 1949 in the Ship Shoal 28 and Eugene Island 89 Fields. The maximum number of sands discovered in any year occurred in 1967 with 36 sands from 17 fields. However, the maximum yearly reserves of 323.491 MMBOE were added in 1960 with the discovery of 28 sands from 10 fields. Sand discoveries have averaged about 15 per year throughout the play's history.

The largest sand in the play was discovered in 1968 in the South Pass 61 Field and contains an

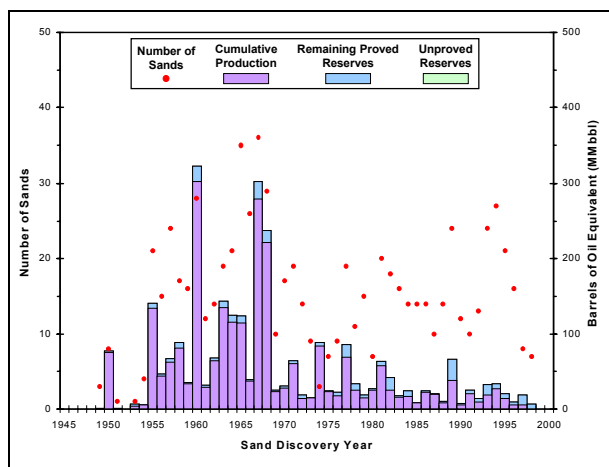


Figure 189. LP P1 exploration history graph showing reserves and number of sands discovered by year.

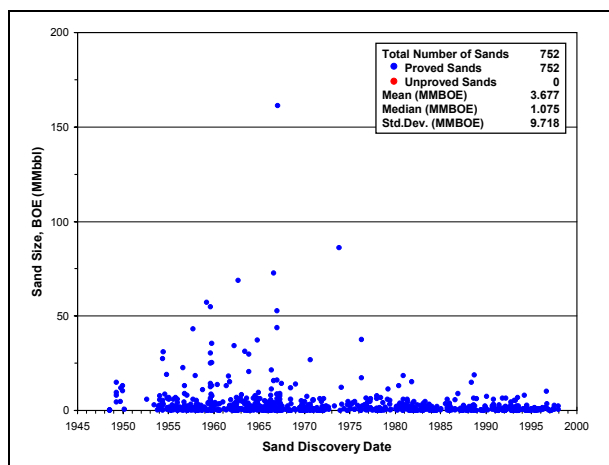


Figure 190. LP P1 sand discovery graph showing the size of sands discovered by year.

estimated 161.297 MMBOE (Figure 190). No sand containing more than 50 MMBOE has been discovered since 1974. The mean sand size for the play is 3.677 MMBOE. Since the first Atlas database cutoff of January 1, 1995, 52 sands have been discovered, the largest of which is estimated to contain 10.283 MMBOE.

## Production History

LP P1 has a 48-year history of production (Figure 191). Oil and gas production began in 1951 and generally increased throughout the 1950's and 1960's. Oil production reached peak values in the mid-1980's and has since fluctuated but declined, while gas production peaked recently, in 1996.

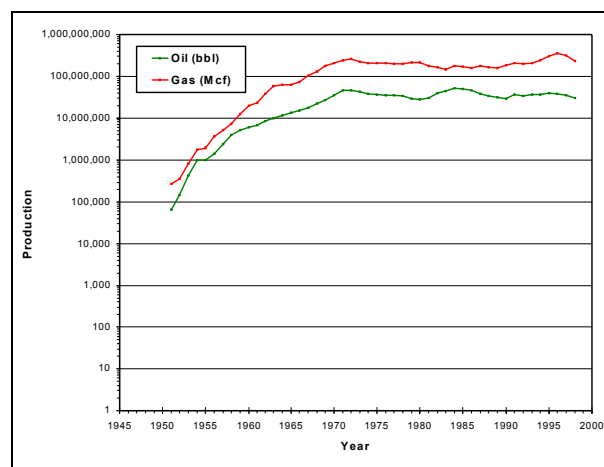


Figure 191. LP P1 production graph showing oil and gas production by year.